Section of Electro-Therapeutics.

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Cardio-vascular Syphilis—an X-ray Study.

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[PROFESSOR GROEDEL, after having given an interesting historical survey and described the various forms of cardio-vascular syphilis, proceeded to discuss the value of Röntgen rays as a diagnostic agent.[1]]

I will now proceed to demonstrate a large series of Röntgen photographs; first, twenty-three cases of arterio-sclerosis, then fifty-nine cases of true and mixed syphilitic lesions of the circulatory apparatus.

If we ask ourselves the question, after having seen these X-ray photographs, whether, indeed, they show the characteristic symptoms which point to syphilis, and can inform us of the seat of syphilitic lesions, the answer in some cases will be in the affirmative, the other cases in the negative. The pictures have been shown from different points of view. Nearly all of them refer to lesions of the aorta. Most authors maintain that they have observed, where syphilis of the aorta was present, enlargement and irregularity of outline in the ascendens only. I believe that this unanimity may be the result of auto-suggestion, due to the fact that pathologists persistently claim that syphilitic lesions in the aorta are found in the greatest number near the entry. When we remember, what the pictures clearly show, that aneurysms are to be found on almost every part of the thoracic aorta, we may regard this as a sufficient proof of the error of such claims.

Only by comparing a series of non-syphilitic disturbances of the heart with a series of similar disturbances caused by syphilis, can one determine the characteristic symptoms of the condition. These are here briefly set out.

(1) In severe *aortic sclerosis*, the X-ray shadow of the large vessels shows so great an enlargement that one is tempted to speak of a spindle-shaped aneurysm. But it is not advisable to do so, for even anatomists cannot always be sure whether dilatation or a spindle-shaped aneurysm is present. All parts of the aorta are dilated, but the ascendens in particular, in most cases. The arch comes well forward into the lung area. On the photograph its shadow appears remarkably dark, and easily distinguishable from the lighter shadow of the descendens. Occasionally "plaques" of shadow are observed in the aorta. More frequently the margins of the shadows of the vessels appear to be streaky. This is the result of tangential projection of calcified regions.

(2) Severe *dilatation of the aorta* is also occasionally found in syphilitic aortitis, so that we are again tempted to speak of spindle-like aneurysm. Generally the diffuse dilatation is much less than in cases of true arterio-sclerosis. In the first place the three parts (ascendens, arch and descendens) which appear in the shadow of the aorta are less well differentiated. In a case of syphilitic aorta the border line

[1] It is regretted that owing to lack of space only the part of the paper dealing with the X-ray study can be published in this Section's *Proceedings*. The same applies to the Discussion on the paper.

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is frequently indistinguishable. Further, the arch does not protrude into the field of the lungs, as in sclerosis; it maintains an easy arch-like curve. It is correspondingly less clearly defined in intensity from the other parts of the aorta.

(3) *Sac-like aneurysms* are usually the result of syphilitic aortitis. Occasionally they may be of traumatic origin. The characteristic sign of a sac-like aneurysm is a protrusion of shadow from the line of the shadow of the vessels. The difference between the X-ray diagnosis of aneurysms and tumours cannot be minutely discussed here.

(4) Cases of *endocardial disease* of the aortic valves generally show an intensely dilated and hypertrophic ventricle, so that the shadow of the heart is recumbent and cylindrical. In nearly every case the base of the aorta is somewhat enlarged.

(5) These characteristics are not found in *syphilitic insufficiency of the aortic valves.* The vitium is probably slower in development, and the hypertrophy of the ventricle occurs earlier. In most cases not only is the aorta ascendens enlarged, but there is a slight diffuse enlargement of the whole of the visible aorta.

(6) I have not yet been able to come across a case of *syphilitic stenosis of the aortic valves.*

(7) In cases in which *endocardial heart failure* was present before infection by syphilis, syphilitic lesions may often not be visible in an X-ray photograph. I should be disposed to assume that in such cases the aorta is less subject to syphilitic infection, but I find no confirmation of this view in any work on the subject. If treatment of the heart has no result, I conclude that such patients are suffering from syphilitic disease of the cardiac muscle, liver, etc.

(8) In cases in which the *coronary vessels* have been closed by a *syphilitic lesion of the aorta*, the X-ray photograph shows the characteristics of aortic disease, as mentioned above.

(9) In *syphilitic disease of the cardiac muscle* the relatively slight enlargement of the heart is often remarkable.

(10) In *syphilis of the liver* there is often found a secondary myocardial lesion, with no characteristic symptoms shown by X-rays.

(11) My own considerable researches have shown me that *syphilitic lesions of the lungs* are easily recognizable in X-ray photographs. There are present nodular gummata of the lungs, either coarse or fine, frequently accompanied by cirrhotic processes. Or the latter may be found isolated; either with cirrhotic stenosis, or sometimes with pneumonic processes; finally, there may be cirrhotic processes associated with emphysema and asthma. Nevertheless all these symptoms may be, and frequently are, misunderstood, in connexion with heart and lung affections. The best results in such cases are obtained by the use of strong antisyphilitic remedies.

The slides exhibiting diseases of the cardiac muscle and aorta showed that we frequently find shadows in the lungs which would appear to point to true pulmonary syphilis of the lungs; in any case these are not really typical of the X-ray pictures of cardiac stasis of the lungs. In syphilis there is a remarkably frequent occurrence of exudation from the right side of the lungs; in cardiac stasis exudation from the left side preponderates. I am willing to assume that in many cases of circulatory disturbance due to syphilis, not only the heart and liver symptoms, but also the lesions of the lungs, may be due to syphilitic infection.

(12) There is not much to be said on the subject of X-ray photographs of *congenital syphilis.* I suppose that in such cases the same symptoms are present as in acquired syphilis.

Mixed cases may arise—e.g., vitia with syphilitic circulatory disturbance, or the latter with sclerotic lesions of the cardiac muscle or the aorta. In these cases,

differential diagnosis may not be necessary, as the treatment will in any event have to be of a mixed nature.

Lastly, exact diagnosis is of extreme importance, since the methods of treatment for syphilitic and non-syphilitic disturbances of the heart are quite different. Once we have seen a large number of cases which have undergone heart treatment for years without benefit, improving almost in a single night with the introduction of specific treatment, we feel that the trouble taken in establishing the diagnosis has been well worth while. I take a view diametrically opposed to that of most authors, in maintaining that the circulatory apparatus is generally able to stand the treatment. In cases in which the lesions of the vessels and heart show no tendency to heal, or in which the spirilla have become immune to antisyphilitic treatment in any reasonable dose, it may be discovered that treatment has been begun too late.

Discussion.—Dr. JOHN PARKINSON said that in spite of the established pathological teaching that syphilitic aortitis was generally more pronounced in the ascending portion of the arch of the aorta, the lecturer had held that this fact was seldom of diagnostic value in its radiographic diagnosis. Though this might be true generally, he (Dr. Parkinson) had seen sufficient cases in which the first part of the aorta was so disproportionately enlarged, and yet without saccular aneurysm, that the diagnosis of syphilitic aortitis at once occurred to him.

The lecture had been of great value in showing how much could be learned by X-ray examination in a single ætiological variety of circulatory disease—that due to syphilis. The slides shown had amply proved its value in distinguishing atheromatous aortic disease from syphilis, but he (Dr. Parkinson) would draw attention to the fact that the aortic outline might be used in helping to distinguish between hyperpiesis without gross arterial change, and the atheromatous aorta where the blood-pressure might be little if at all raised. Professor Groedel had rightly insisted that combinations of atheroma, syphilis, and high blood-pressure, might produce a complicated picture. If so much could be learned by radioscopy in individual patients suffering from this group of vascular disease (and its value might be no less in the rheumatoid group and in congenital malformations), we could not afford in the interests of these important patients to rely upon percussion so much as in the past. Percussion still had a place in the diagnosis of cardiac disease but it was rapidly becoming inadequate and this could not be seen better than in the instance of cardio-vascular syphilis, as had been so ably demonstrated by Professor Groedel.

Dr. STOLKIND said he had come to the conclusion that as a rule, *where the X-ray showed dilatation of the aorta* in adults, then *syphilitic aortitis was present.*

Dr. JAMES F. BRAILSFORD (Birmingham) showed a series of lantern slides of a case of aneurysm of the abdominal aorta, which demonstrated a further radiographic appearance of great value in the diagnosis of this lesion, i.e., scalloping of the bodies of the lumbar vertebræ, due to erosion of the bone by the aneurysm except near the intervertebral discs, which were not eroded, and projected into the aneurysmal sac. This being so, the vertebral bodies did not "fall together" as in tubercle or new growth, and an antero-posterior radiograph might either reveal no abnormality or, as in this case, an appearance which had been on several occasions diagnosed as osteo-arthritis. In view of the statement made that aneurysm and its diagnosis was of no more interest to the physician than a fungating breast tumour to the surgeon, he (Dr. Brailsford) would say that this patient had had severe symptoms for two years for which he had sought treatment at various hospitals. The condition had been consecutively diagnosed and treated as rheumatism, lumbago, osteo-arthritis and gastro-intestinal disturbance. He eventually came to the Queen's Hospital, Birmingham, with the diagnosis of "twisted kidney," but after examination the patient was sent to the X-ray department for a barium meal examination with the provisional diagnosis of "carcinoma of the splenic flexure." It was on the appearance of the lateral radiograph that the diagnosis of "aneurysm of the abdominal aorta" was made. A post-mortem two months afterwards confirmed the diagnosis.

Dr. GEORGE VILVANDRÉ said that the case of aneurysm of the abdominal aorta shown by the last speaker (Dr. Brailsford) was similar to one known to him (Dr. Vilvandré),

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but the X-ray diagnosis of aneurysm was not always as readily made, for only a very few cases exhibited erosion of the vertebræ. In his own case, which had also been seen in Vienna and Paris, the diagnosis was not definitely made from echinococcal cyst for some time, but was settled by erosion of the vertebræ appearing. Remarks had been made manifesting little interest in aneurysm, but the diagnosis of this complaint had to be made, and the necessity for doing this often devolved upon the radiologist. Though frequently decisive the Wassermann test was not always conclusive; it might be slightly positive in the hands of an expert and negative in the hands of another when made on the same patient at the same time. The radiological evidence became, then, even more necessary. The field of X-ray diagnosis in cardio-vascular disease was becoming more important, and with the electrocardiograph encroaching upon and even in some cases superseding the stethoscope, all facilities should be given to the radiologist to enable him to acquire more knowledge in that branch of medicine. This could only be done by the assemblage of correlative facts, clinical and radiological, and ultimate diagnosis (post-mortem). A member of the X-ray department of a hospital might wisely be set apart for such a purpose, working entirely with the physician for heart disease.

Dr. S. W. PATTERSON said that syphilitic myocarditis showed on the X-ray screen a large flabby heart flattened out on the diaphragm, with weak beats, often slow and accompanied by a low blood-pressure.